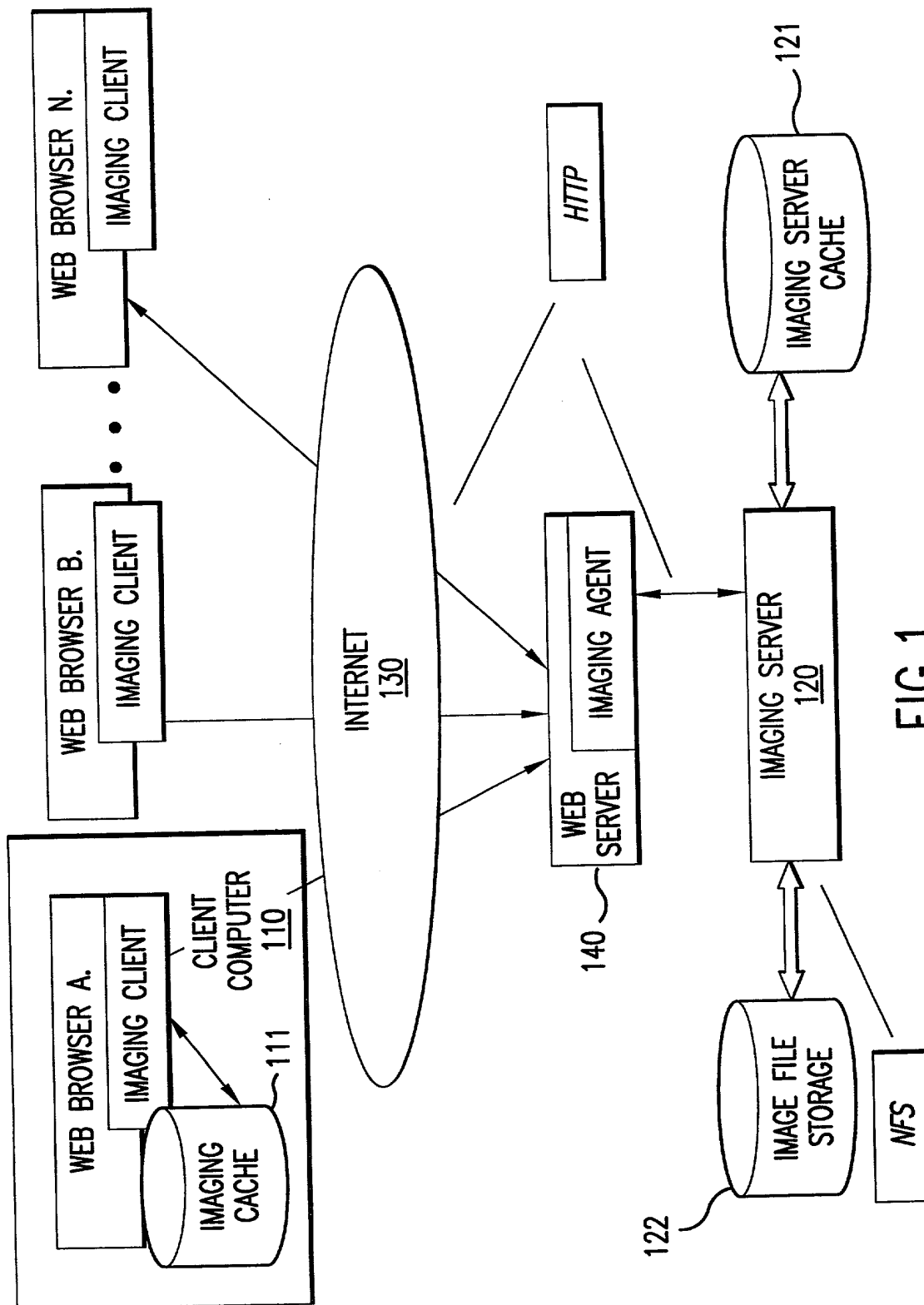


SYSTEM ARCHITECTURE BLOCK DIAGRAM



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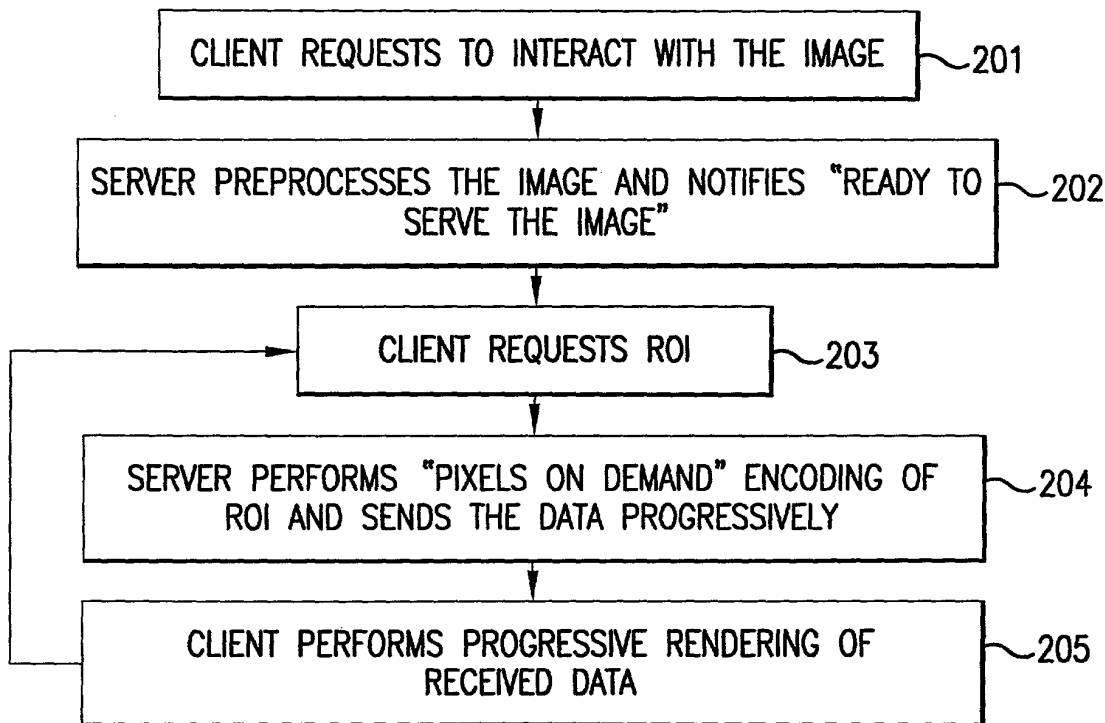


FIG.2

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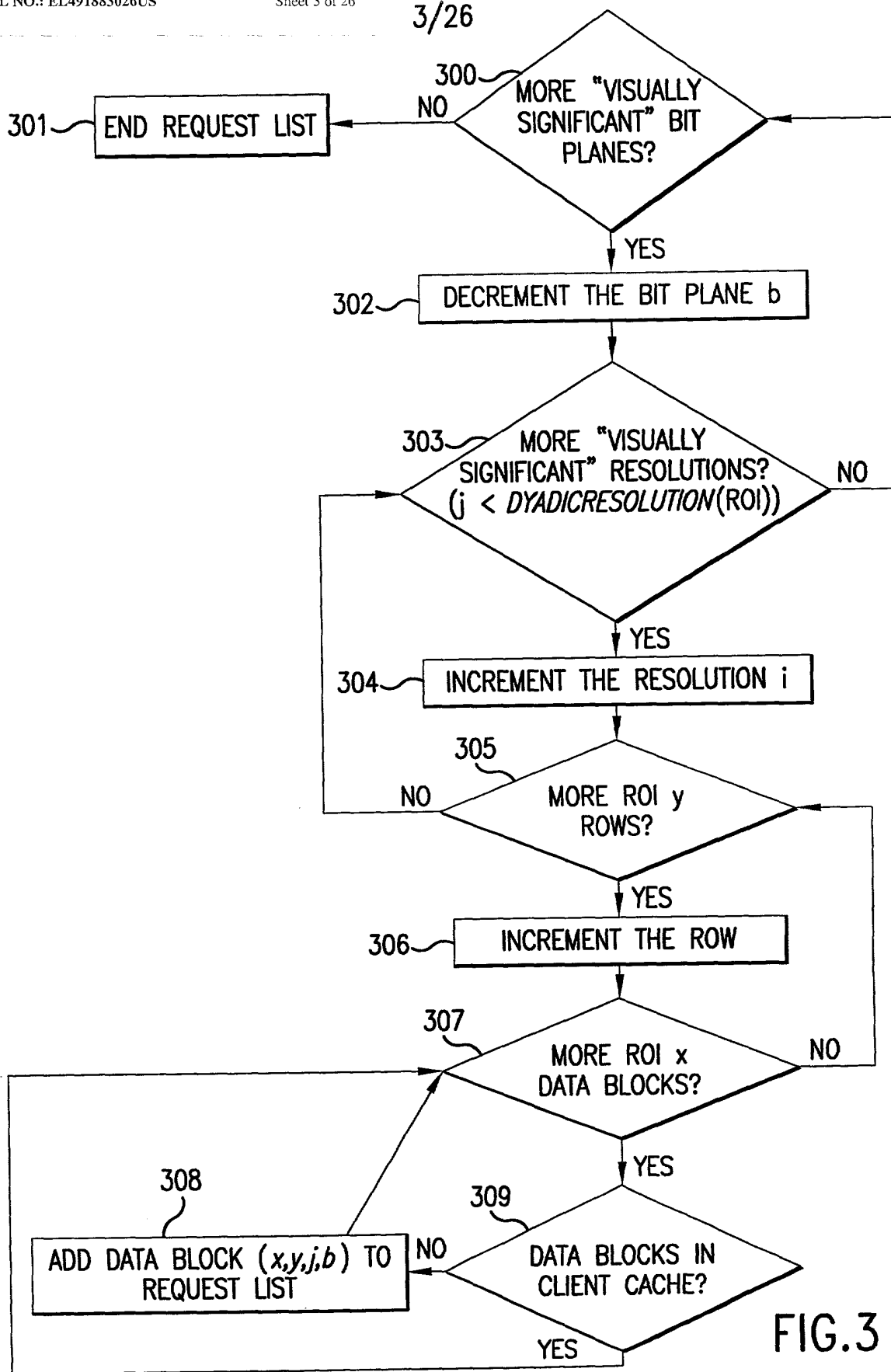


FIG.3

09837862-031300

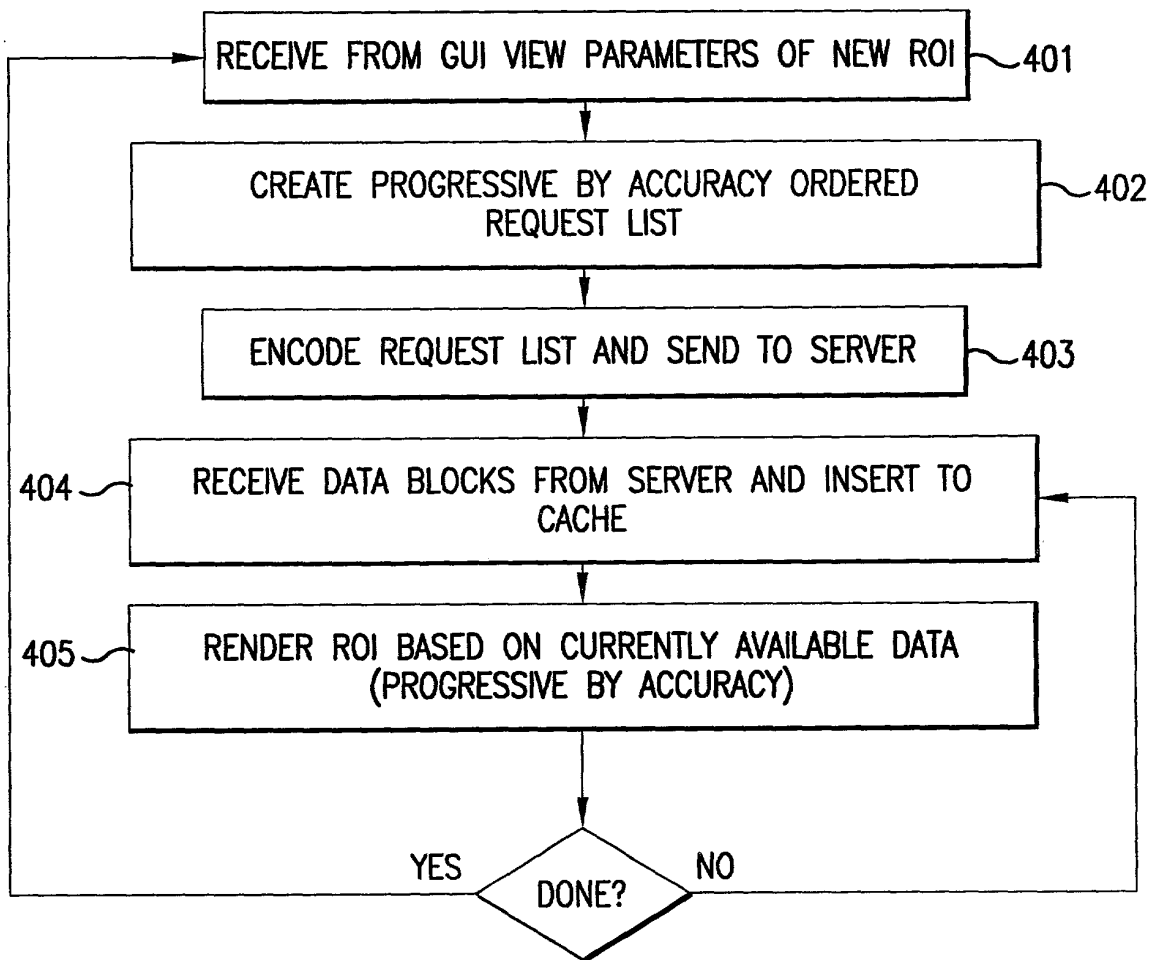


FIG.4

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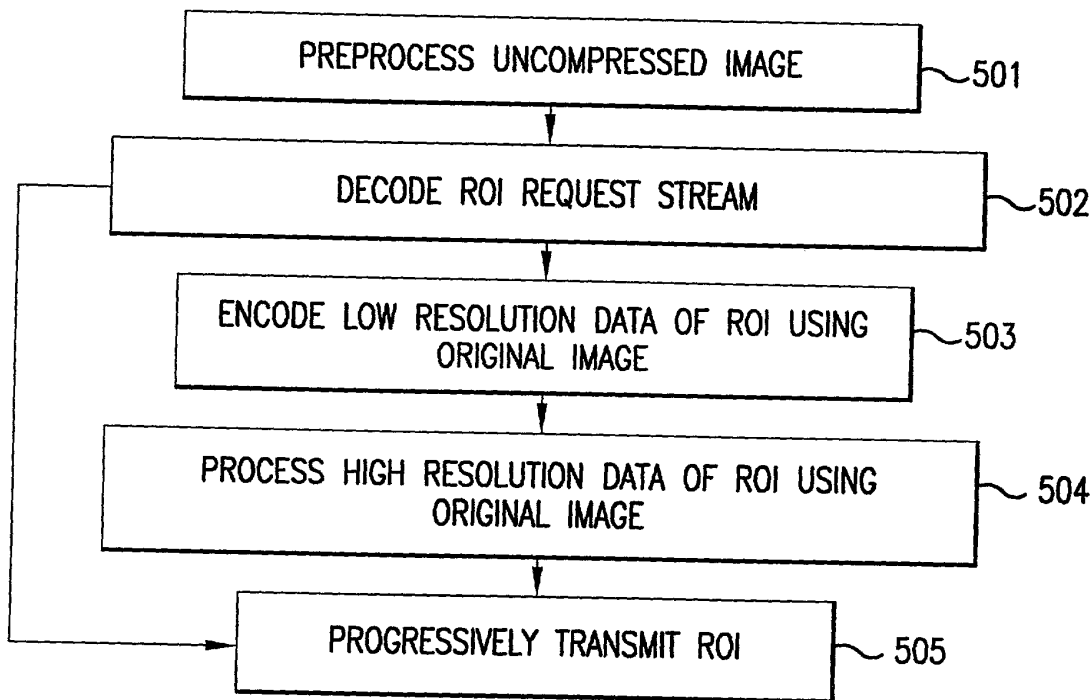


FIG.5

09837862 01300
20010417

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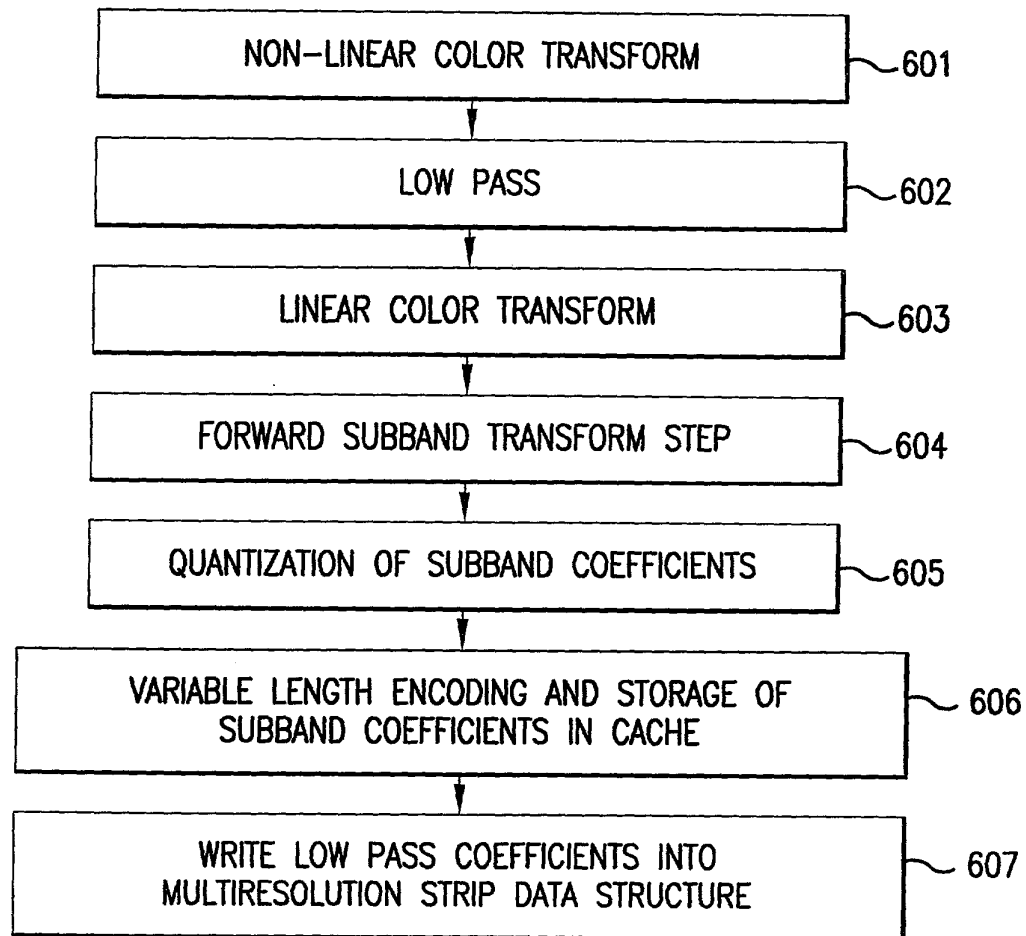


FIG.6

0987862 0330

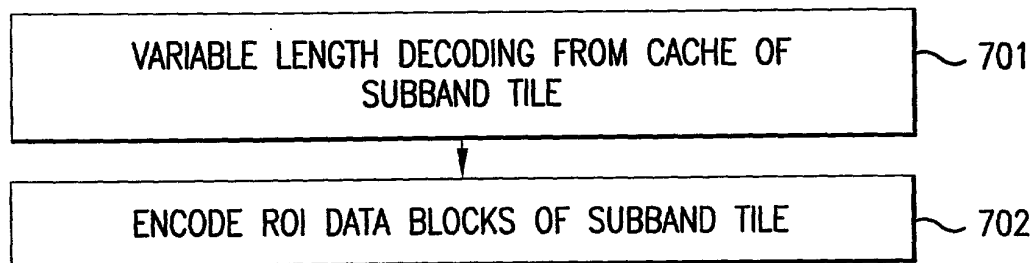


FIG.7

09/837,862 "2001-04-17"

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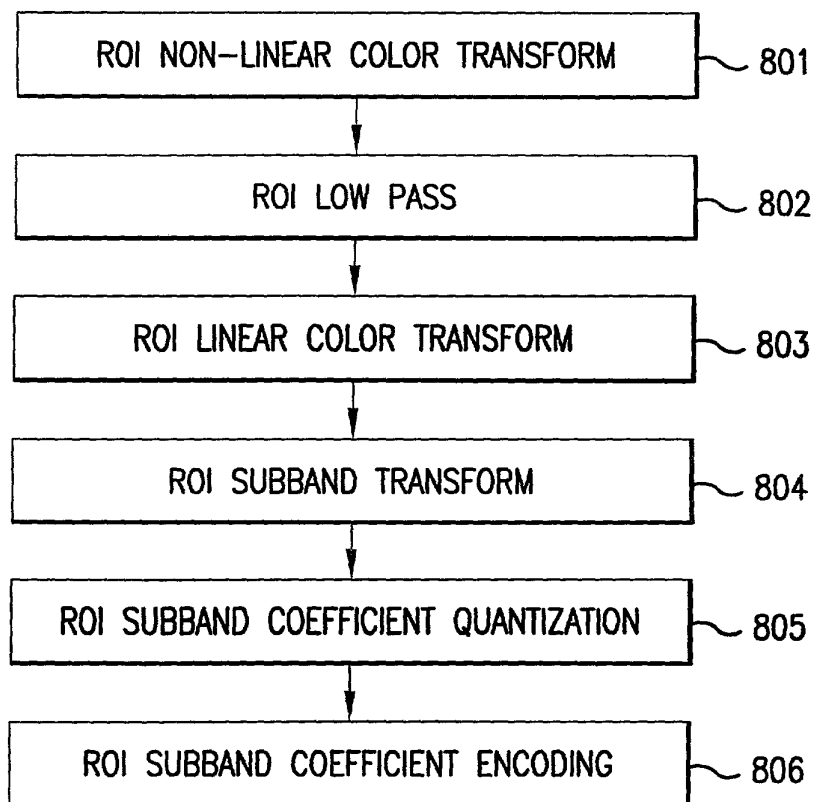


FIG.8

09/837,862 "031300"

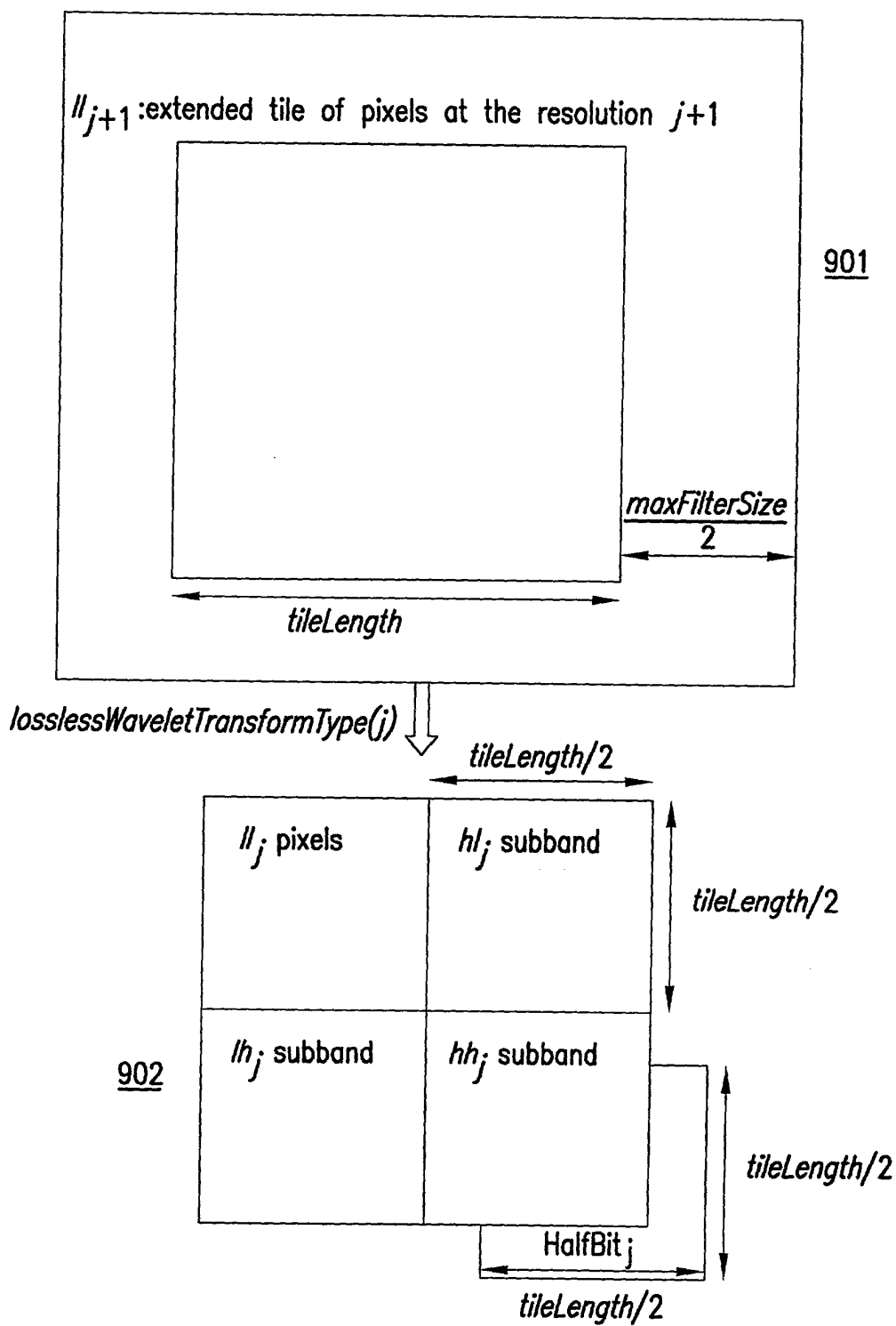


FIG.9

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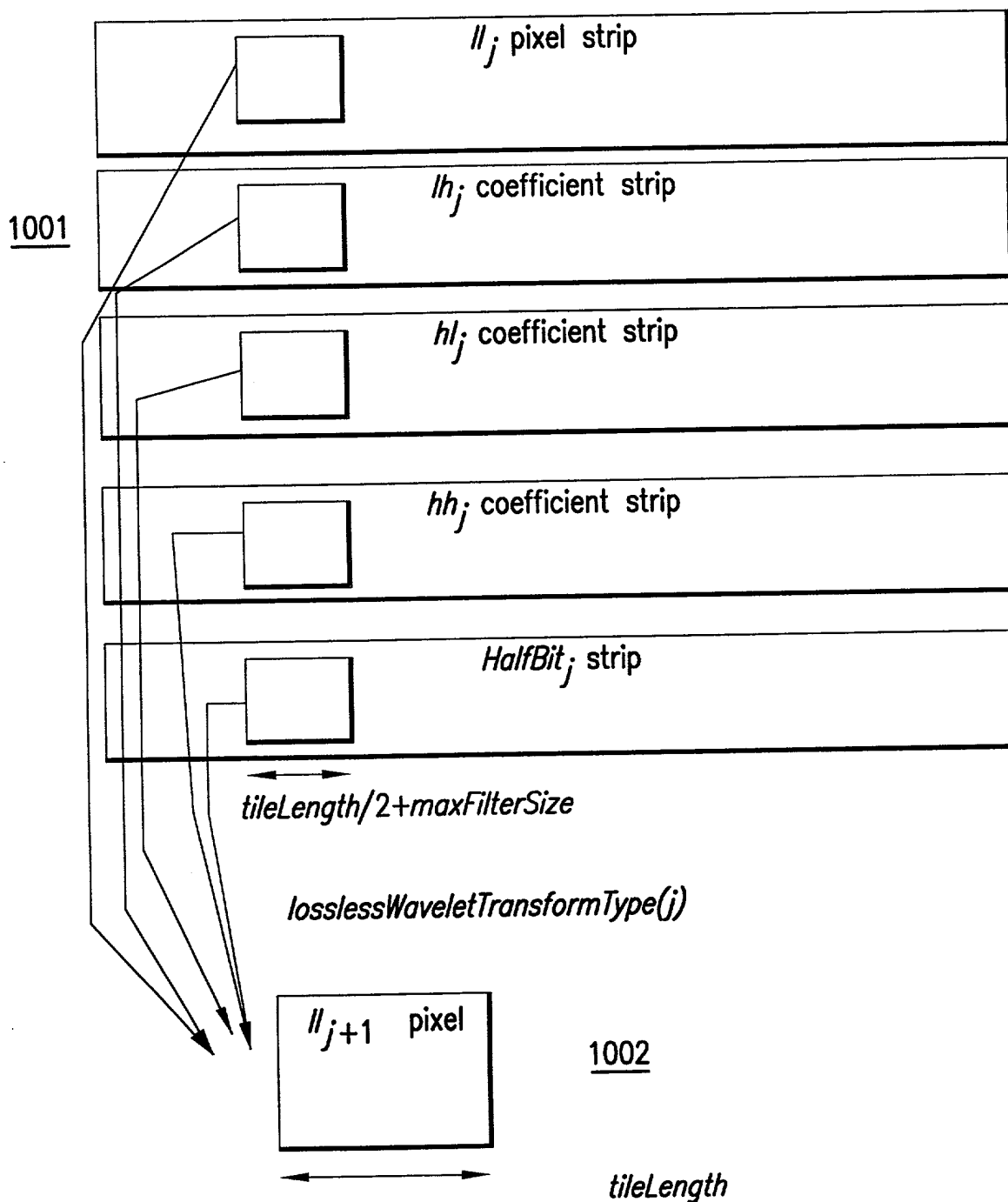


FIG.10

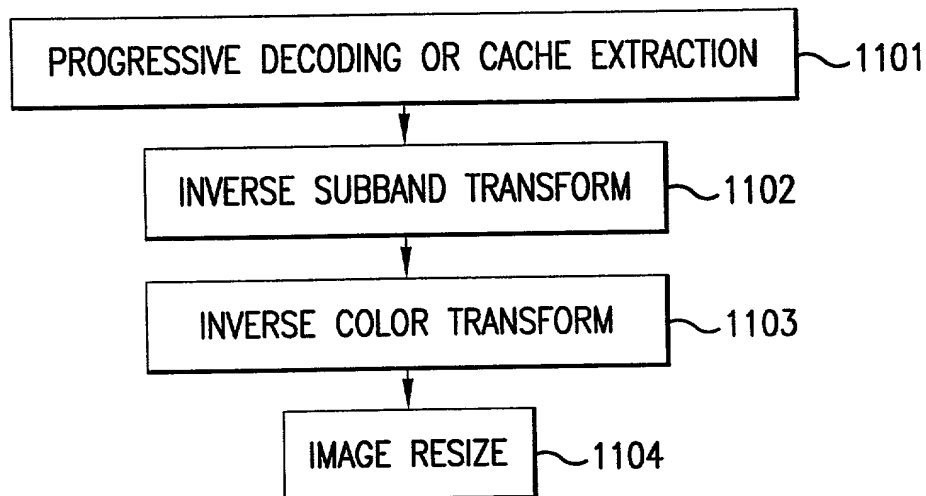


FIG. 11

09837862-03130

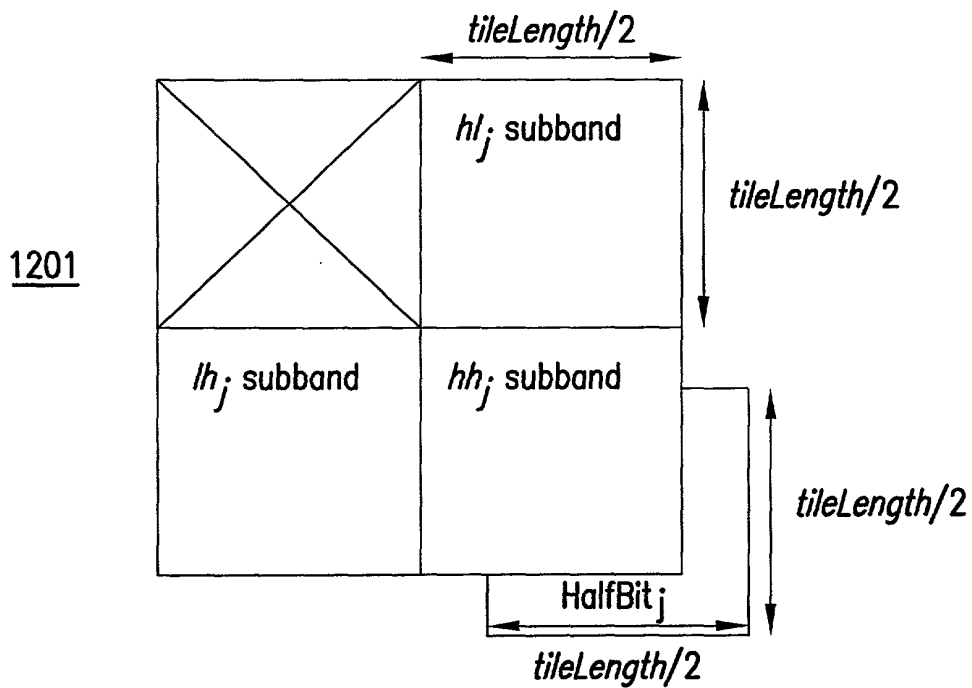


FIG.12

09/837,862-2934E860

RGB <-> YUV REVERSIBLE CONVERSION

FORWARD:

$$Y_r = \left\lfloor \frac{R + 2G + B + 2}{4} \right\rfloor$$

$$U_r = R - G$$

$$V_r = B - G$$

INVERSE:

$$G = Y_r - \left\lfloor \frac{U_r + V_r + 2}{4} \right\rfloor$$

$$R = U_r + G$$

$$B = V_r + G$$

1301

FIG.13

09/837,862, 031300

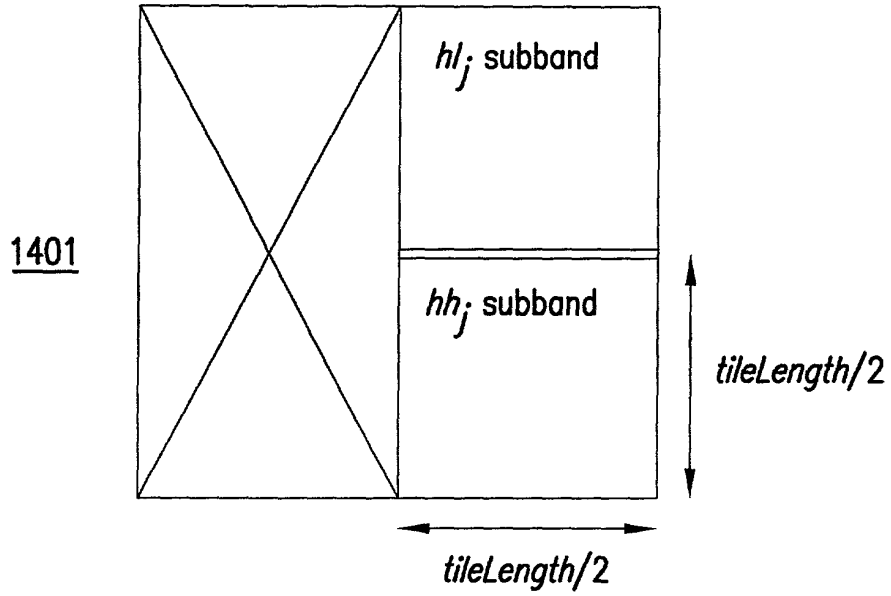


FIG.14

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```

bitModel.startModel () ;
zeroCoefModel.startModel () ;
coefSignModel.startModel () ;

while (encoder.moreCoef ()) {
    if (encoder.isCoefReported ()) {

arithmetic_encode_symbol (bitModel,encoder.reportedCoefPrec
isionBit ()) ;
    }
    else {
        if (encoder.isCoefExactZero ()) ;
        arithmetic_encode_symbol (zeroCoefModel,true) ;
        else {
            arithmetic_encode_symbol (zeroCoefModel,false) ;
            arithmetic_encode_symbol (coefSignModel,encoder.getCoefSign
            ()) ;
        }
    }
}

```

FIG.15a

```

bitModel.startModel () ;

for (int i = 0 ; i < hBlockSize ; i++) {
    for (int j = 0 ; j < hBlockSize ; j++) {
        arithmetic_encode_symbol (bitModel,
coefHalfBit [i] [j]) ;
    }
}

```

FIG.15b

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 2001-04-17

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```

                                bitModel      .startModel() ;
zeroCoefModel.startModel() ;
coefSignModel.startModel() ;

decoder.initializeLSBPlaneCoefScan () ;

while (decoder.moreCoef ()) {
    if (decoder.isCoefReported ()) {
        if (decoder.isLHCoef ()) {
            decoder. updateLSB (0) ;
        }
        else {
            decoder.updateLSB (arithmetic_decoder_symbol (bitModel)) ;
        }
    }
    else {
        if (!decoder.isLHCoef ()) {
            if (!arithmetic_decoder_symbol (zeroCoefModel))
                decoder.setLSB (arithmetic_decoder_symbol (coefSignMode
                    1)) ;
        }
    }
}

```

FIG.16a

```

bitModel.startModel () ;
for (int i = 0 ; i < hBlockSize ; i++) {
    for (int j = hBlockSize ; j ; j--,p++) {
        coefHlafBit [i] [j] = arithmetic_decoder_symbol (bitModel) ;
    }
}

```

FIG.16b

09837862, 0313102

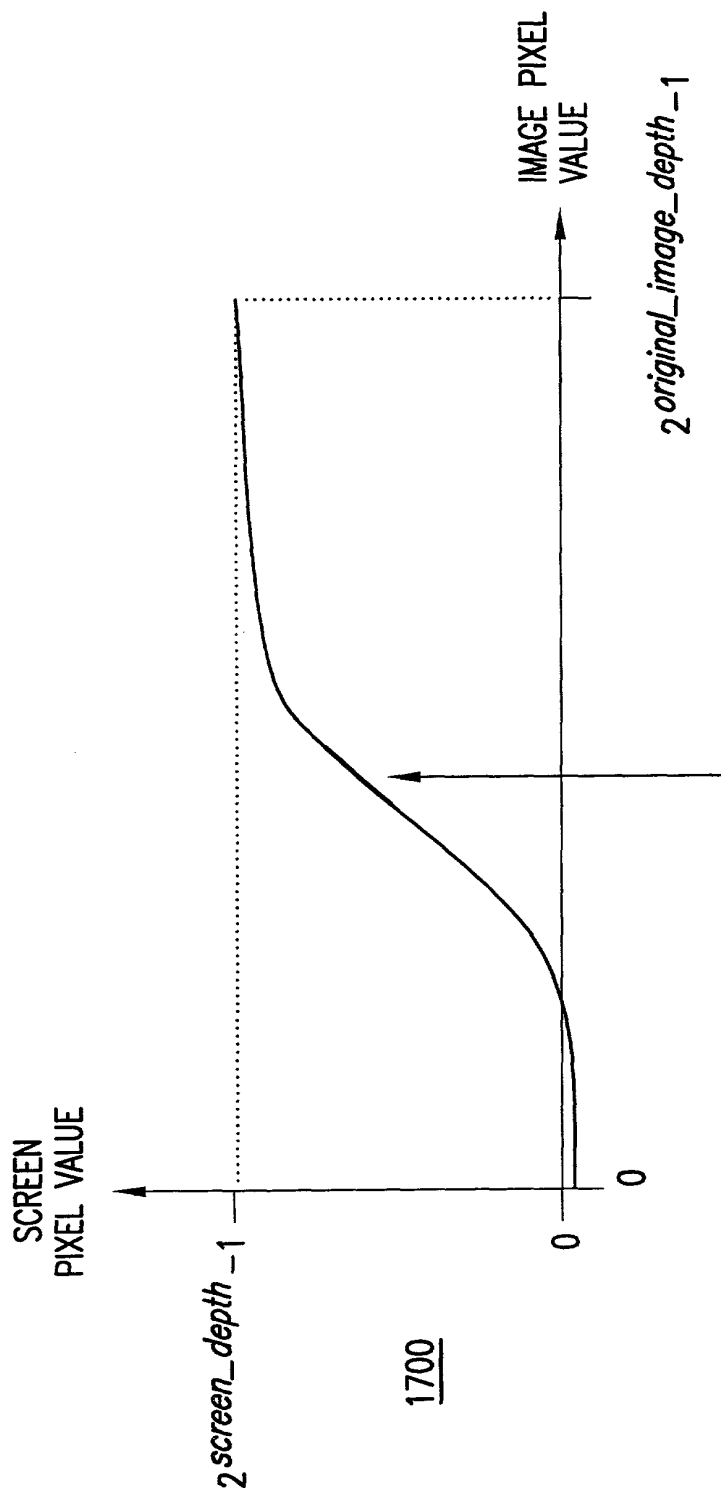
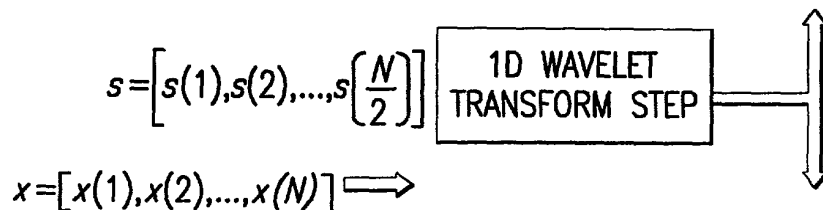


FIG.17

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1800



$$d = [d(1), d(2), \dots, d(\frac{N}{2})]$$

$$X = \begin{bmatrix} x(1,1) & x(1,2) & \dots & x(1,N) \\ x(2,1) & x(2,2) & \dots & x(2,N) \\ \vdots & \vdots & \ddots & \vdots \\ x(M,1) & x(M,2) & \dots & x(M,N) \end{bmatrix}$$



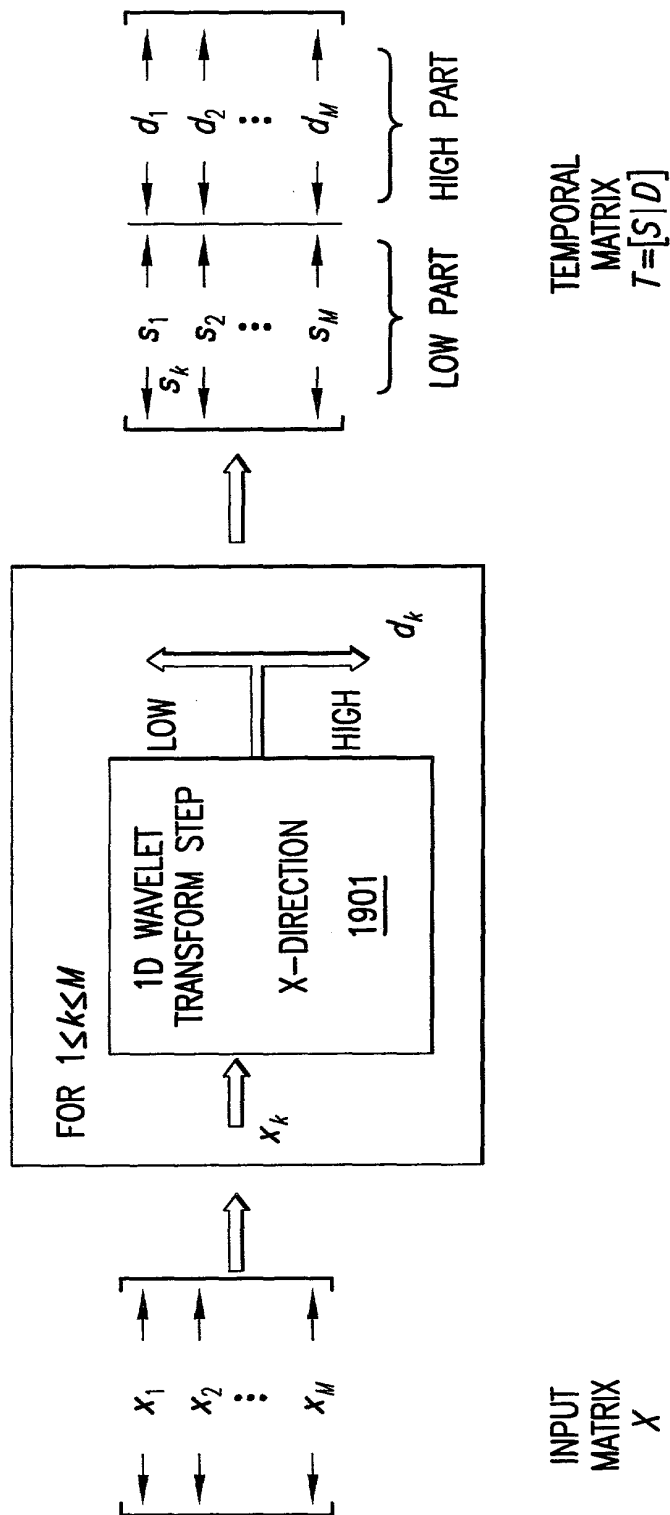
1801

2D WAVELET TRANSFORM STEP

$$\hat{X} = \begin{bmatrix} LL & HL \\ LH & HH \end{bmatrix} = \begin{bmatrix} ll(1,1) & \dots & ll(1,N/2) & hl(1,1) & \dots & hl(1,N/2) \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ ll(M/2,1) & \dots & ll(M/2,N/2) & hl(M/2,1) & \dots & hl(M/2,N/2) \\ lh(1,1) & \dots & lh(1,N/2) & hh(1,1) & \dots & hh(1,N/2) \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ lh(M/2,1) & \dots & lh(M/2,N/2) & hh(M/2,1) & \dots & hh(M/2,N/2) \end{bmatrix}$$

FIG.18

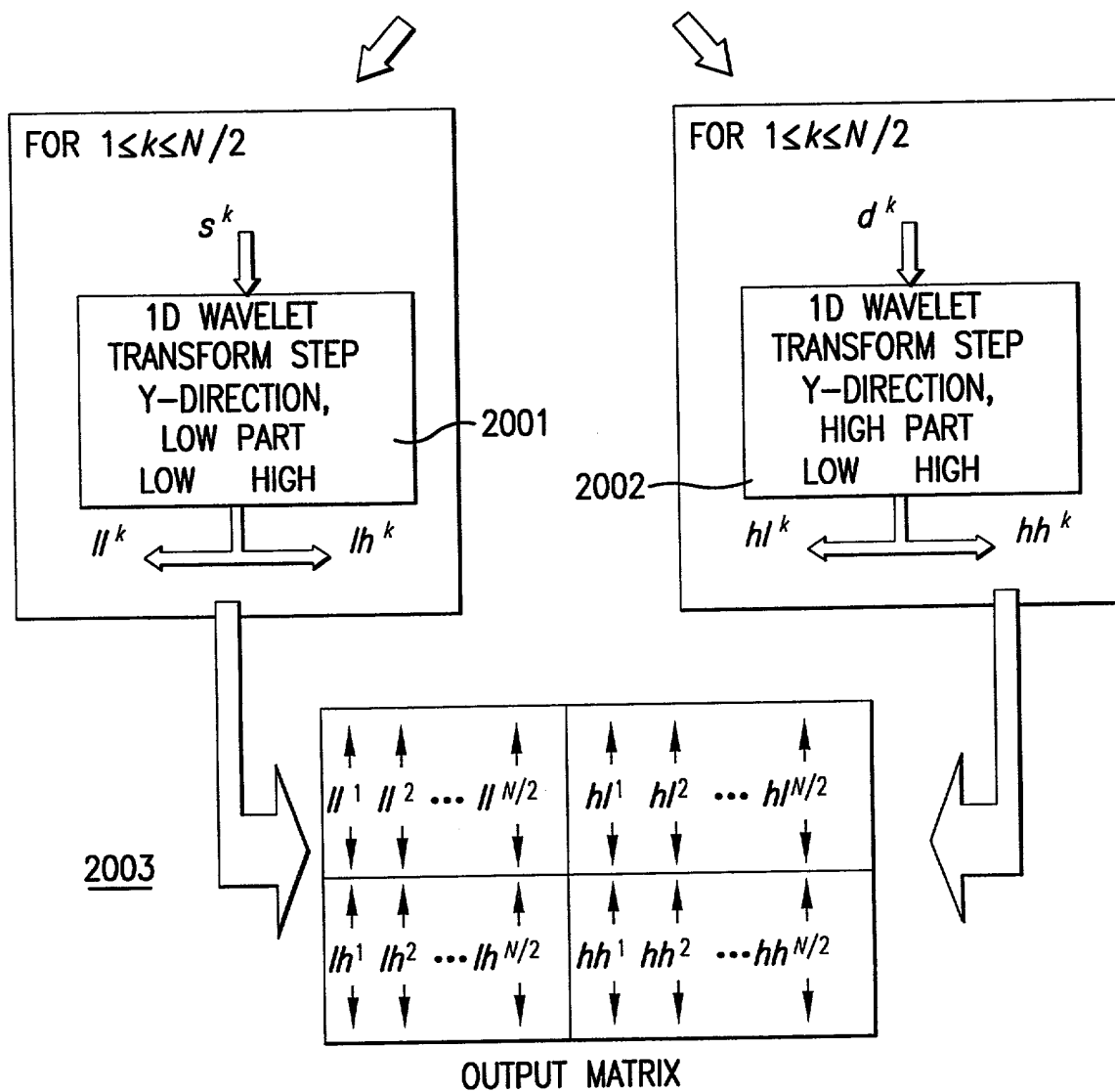
09837862 031302



1901

FIG.19

$$\left[\begin{array}{c|c} \begin{matrix} \uparrow & \uparrow & \dots & \uparrow \\ s^1 & s^2 & \dots & s^{N/2} \\ \downarrow & \downarrow & \dots & \downarrow \end{matrix} & \begin{matrix} \uparrow & \uparrow & \dots & \uparrow \\ d^1 & d^2 & \dots & d^{N/2} \\ \downarrow & \downarrow & \dots & \downarrow \end{matrix} \end{array} \right] \quad 2000$$



OUTPUT MATRIX

$$\hat{X} = \left[\begin{array}{c|c} LL & HL \\ \hline LH & HH \end{array} \right] \quad 2004$$

FIG.20

LET I BE THE ORIGINAL IMAGE,



FOR $0 < i < \text{LEVELS}$



$LL_{\text{LEVELS}-1}$

2100

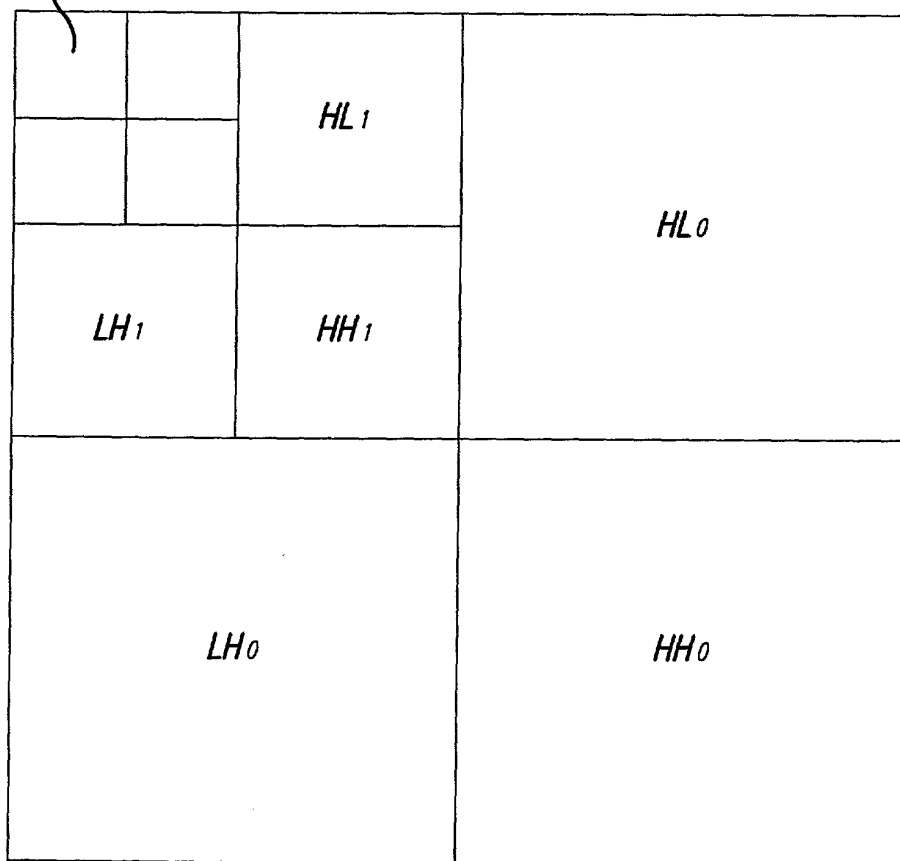


FIG.21

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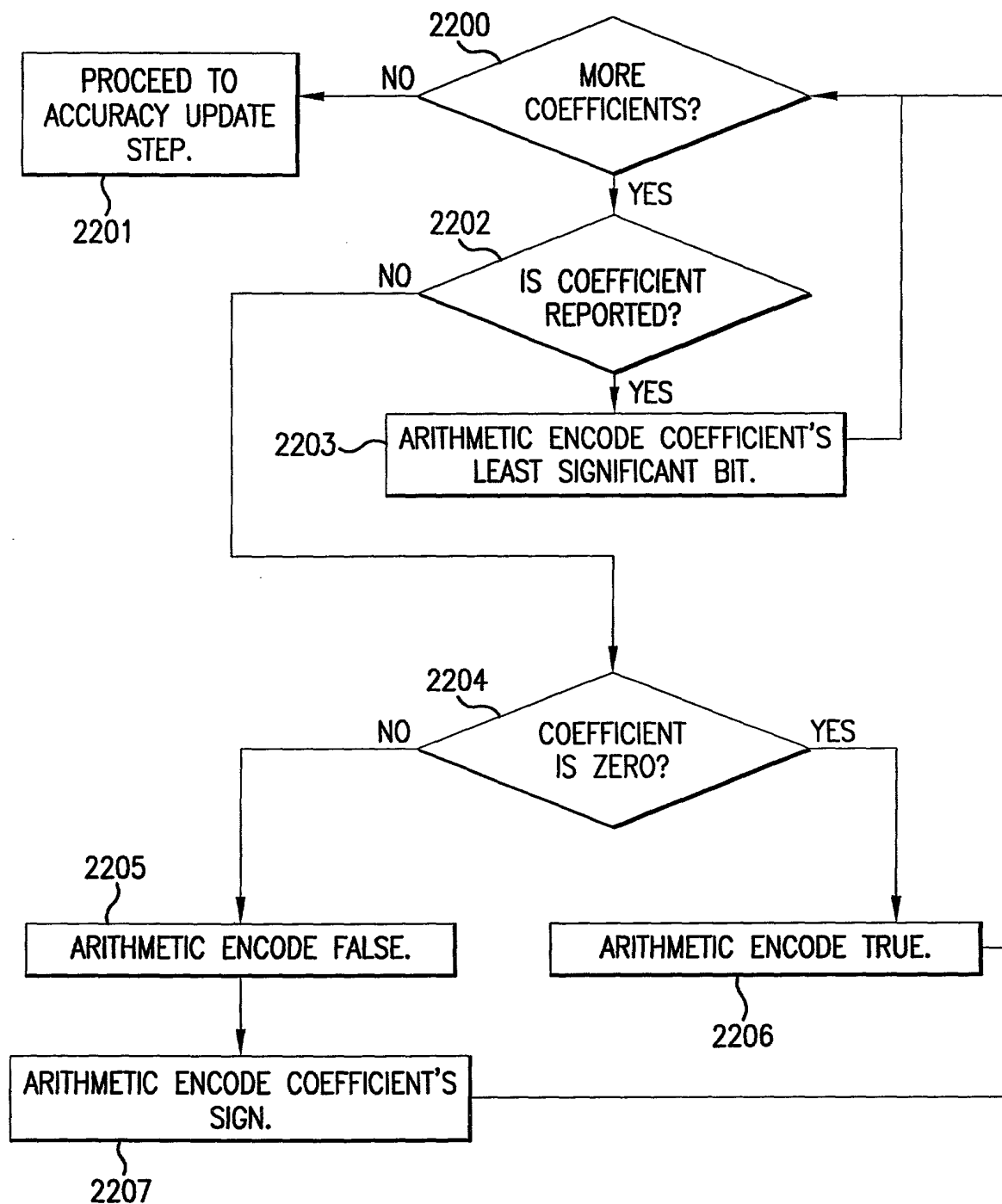


FIG.22

09837862-031302

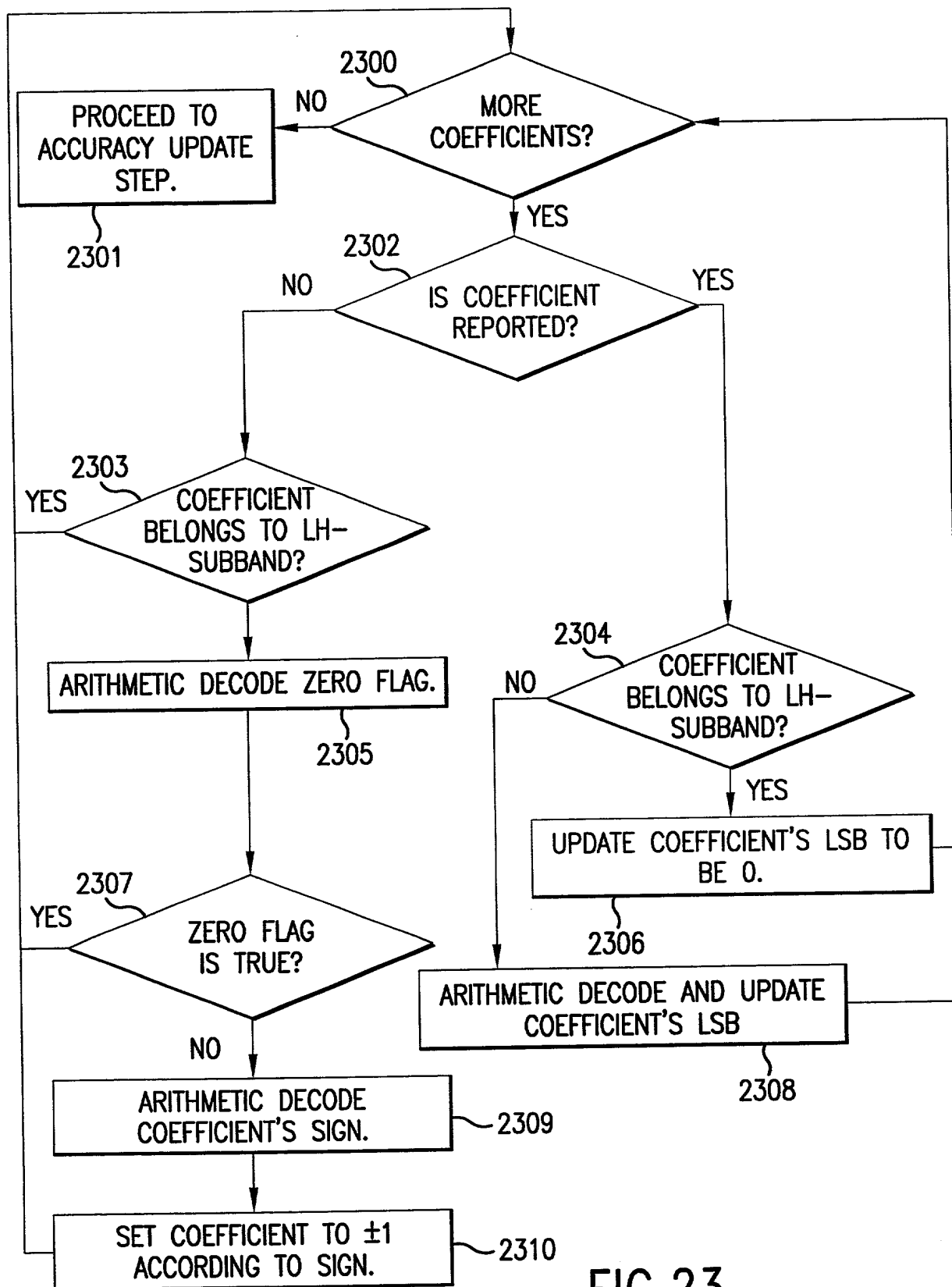


FIG.23

09837862.031300

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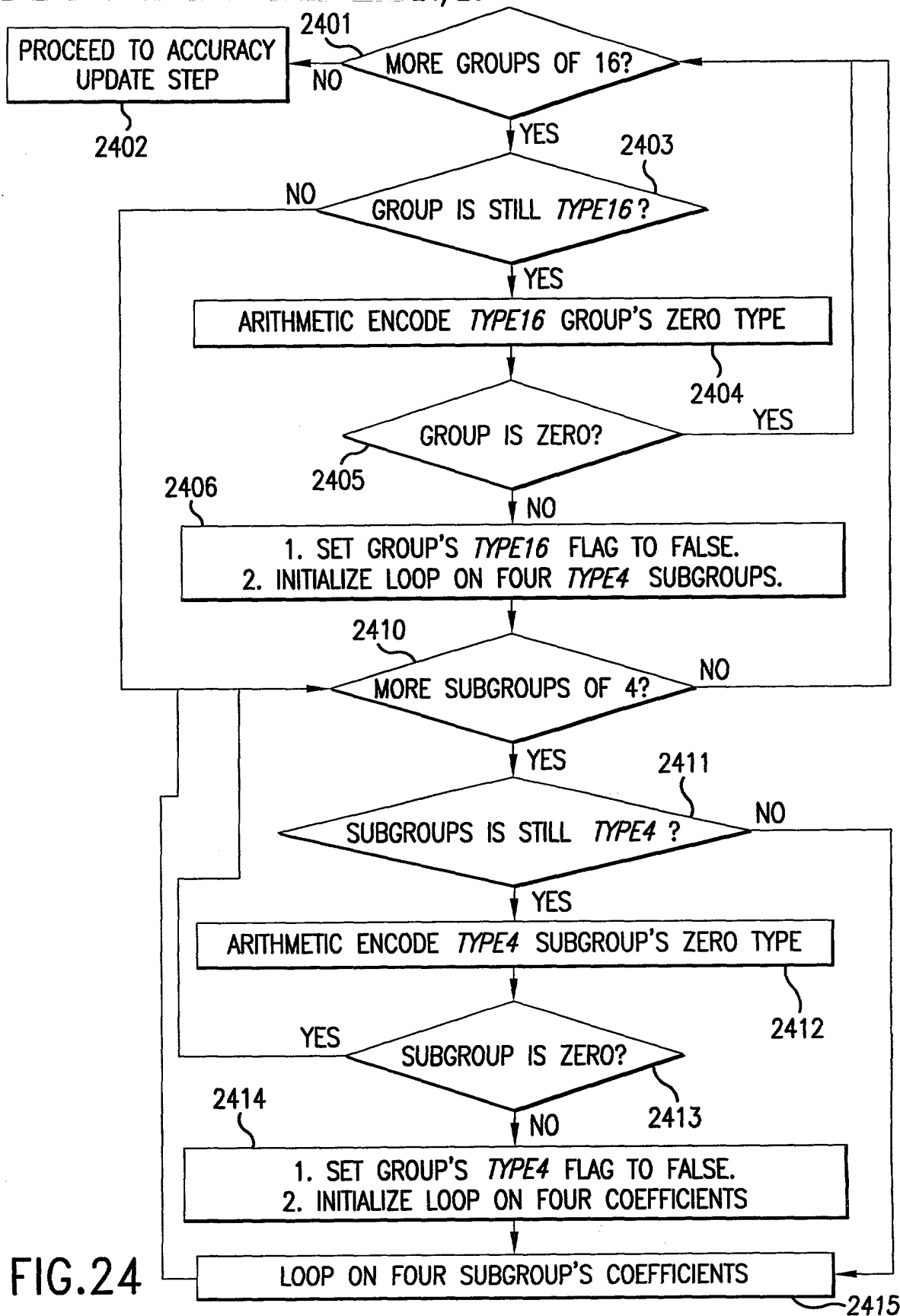


FIG.24

003386-0330

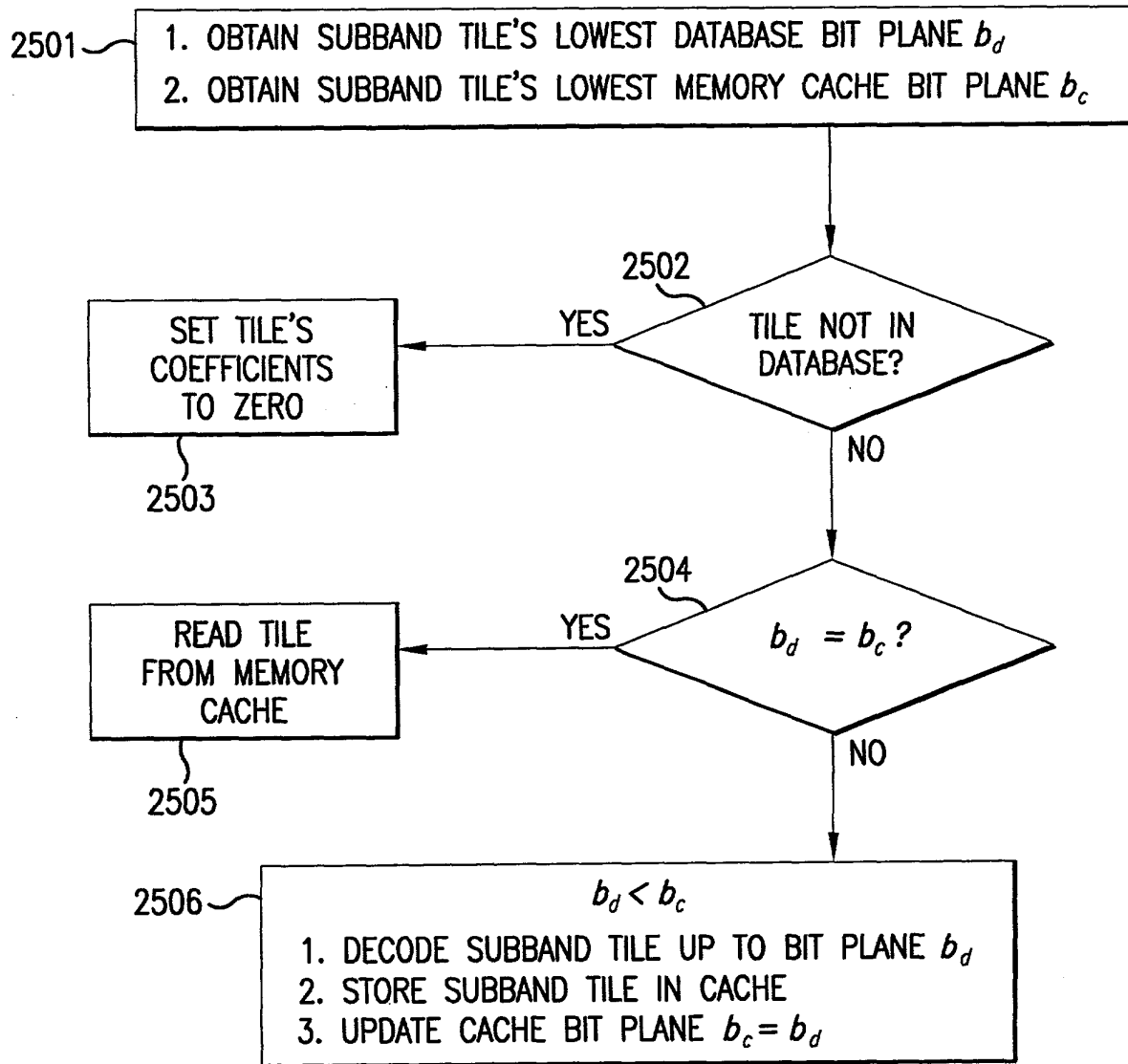


FIG.25

09/837,862, 03/13/02

PREPROCESSING MULTIREOLUTION STRUCTURE

